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(71) Applicant(s)

**JPM International Limited**  
(Incorporated in the United Kingdom)  
Hadfield Road, CARDIFF, South Glam, CF1 8AQ,  
United Kingdom

(72) Inventor(s)

**Adrian Francis Davies**

(74) Agent and/or Address for Service

**Wynne-Jones, Laine & James**  
Morgan Arcade Chambers, 33 St Mary Street,  
CARDIFF, CF1 2AB, United Kingdom

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**G07F 17/32 17/34**

(52) UK CL (Edition Q )

**G4V VAA V118**

(56) Documents Cited

**GB 2251113 A**

**GB 2165074 A**

**US 5752881 A**

**US 5395111 A**

(58) Field of Search

**UK CL (Edition Q ) G4V VAA**

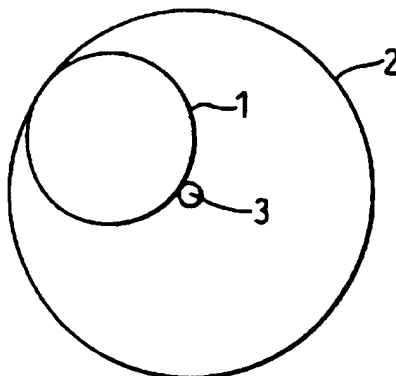
**INT CL<sup>6</sup> G07F 17/32 17/34**

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(54) Abstract Title

**Gaming or amusement with prizes machines**

(57) A reel assembly for gaming or amusement-with-prizes machines has two symbol bearing endless bands 1,2 one within the other, the outer one having a transparency that allows symbols to be superimposed on the win line. The bands may be on rigid reels they may be flexible or one may be on a rigid reel while the other is flexible. The bands may be driven independently, or there may be a common drive, but not one that moves the bands in unison.



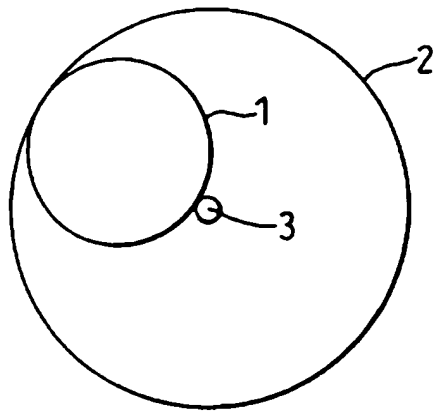
**Fig. 1(a)**

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

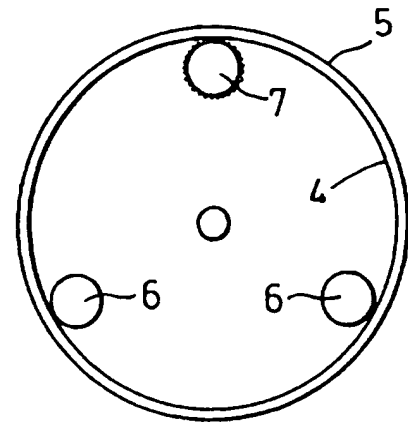
This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

11/17/2005, EAST Version: 2.0.1.4

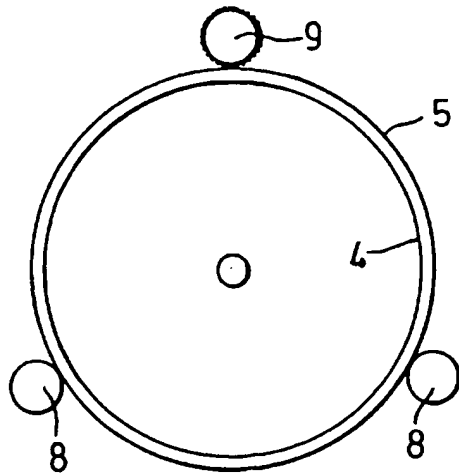
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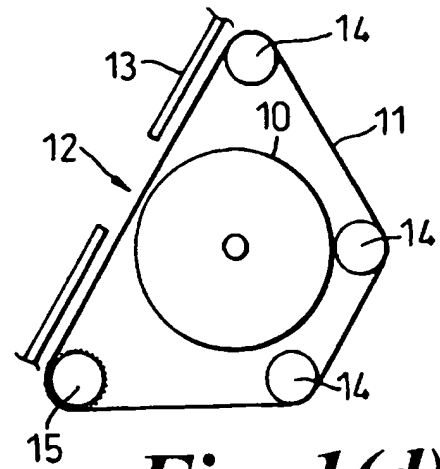
**Fig. 1(a)**



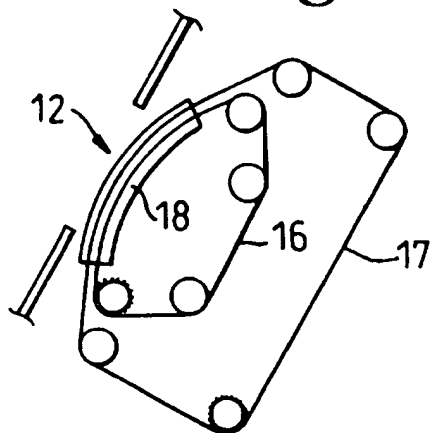
**Fig. 1(b)**



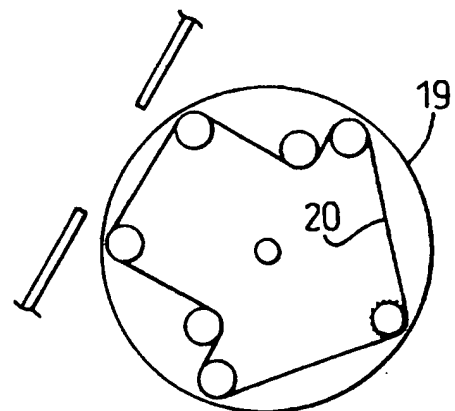
**Fig. 1(c)**



**Fig. 1(d)**

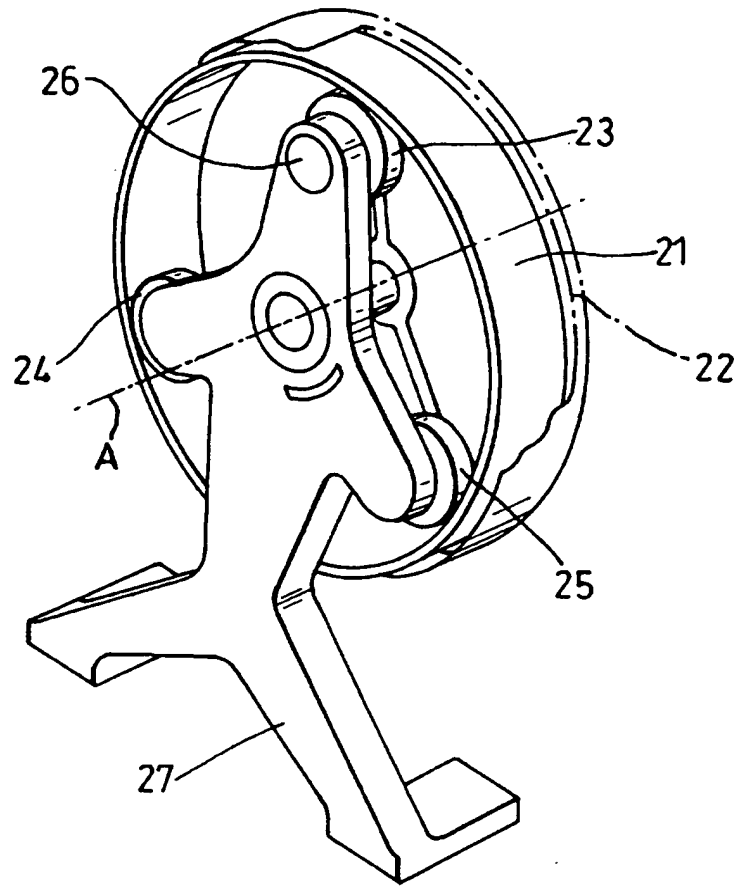


**Fig. 1(e)**

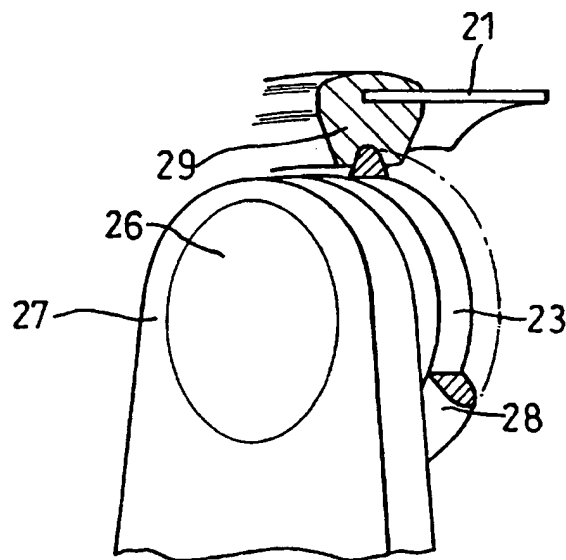


**Fig. 1(f)**

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**Fig. 2**



**Fig. 3**

Improvements relating to Gaming or Amusement  
with Prizes Machines

This invention relates to gaming or amusement with prizes machines. It is concerned with those commonly known  
5 as fruit machines in which several reels, usually three but sometimes four, with symbols around their peripheries, are set spinning to stop in a random or apparently random manner. If there is then a certain combination of symbols showing in a win line through windows in a display panel, a  
10 prize is awarded. Usually there is a set of winning combinations with a graded set of prizes.

Players are attracted to machines which offer large prizes. This means long odds on a winning combination and therefore lots of symbols. This leads to large reels with  
15 room for twenty or more symbols and/or to four or even more reels.

But the trend is to reels with larger, more prominent symbols, and to keep the reel size in bounds the number of symbols per reel is reduced to twelve or sixteen. The game  
20 software can be written to compensate for this reduced number and to achieve a payout percentage comparable with that of a machine with more symbols and/or reels. But that cannot disguise the fact that the player does not see many different symbols.

25 It is the aim of this invention to have a compact reel assembly where the visible symbols are large, but which can offer a greatly extended number of combinations and consequently a substantial top prize and a good spread of

lesser prizes.

According to the present invention there is provided a reel assembly for gaming or amusement-with-prizes machines, the assembly having two symbol-bearing endless bands one within the other and movable around their own loops, the outer one having a transparency that makes the portion presented to the player, when movement ceases, display an overlay of one symbol over another.

The bands may be on rigid reels. In one form the inner reel has a diameter less than the radius of the larger reel, the reels being virtually tangential at the win line position. Alternatively, the reels may be co-axial, the inner one being marginally smaller than the outer one. In that case, one reel is preferably supported and guided by at least three rollers distributed around its periphery, at least one roller having a driving engagement with said one reel. If said one reel is the outer reel, the rollers are external, while if said one reel is the inner reel, and the rollers are internal.

In other embodiments at least one band is flexible, entrained round rollers, provided with sprocket holes, and driven by a sprocket wheel.

The outer band may be flexible and the inner band on a rigid reel, or both may be flexible. In those cases said portion of the outer band presented to the player may be guided to simulate the periphery of a large radius reel.

It is also possible for the inner band to be flexible and the outer band on a rigid reel.

Preferably the inner band has symbols on a translucent background which enables the overlaid symbols on the win line, at least, to be backlit. The outer, transparent reel band will have opaque numbers, letters or symbols on it that  
5 will generally not completely mask the symbols on the inner reel band. The player may see on the win line, for example, a bunch of cherries overlaid by the numeral 7.

Preferably, the bands will be independently driven. However, it would be possible for them to have a common  
10 drive but not to move in unison. One way of doing this is for one band to be indexed by a lost motion connection from the continuous drive to the other band.

These arrangements allow the inner band to carry at least seven or eight symbols and be within the larger band  
15 without mutual interference of the drives to those bands. As stated, bands can be virtually tangential at the win line position, but in some cases, due to the different curvatures, only this line may be visible. The lines above and below could show, but there would be parallax and no clear  
20 image of one symbol superimposed on another. In those cases, back lighting of the win line only will generally be provided.

The bands can, however, have their curvature matched over a larger arc, as mentioned above, so that the windows  
25 through which the bands are seen could each reveal three or even five symbol positions, the central one being on the win line. There can then be more back lighting.

Flexible bands will conveniently be provided with

sprocket holes similar in format to those of a 35 mm film, and be similarly driven. They can be constrained to assume a "flatter" configuration than a cylindrical reel and to take up less space. They can be longer than the circumference of a rigid reel and accommodate more symbols.

For a better understanding of the invention, some embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows diagrams of possible reel and band assemblies,

Figure 2 is a diagrammatic perspective view of a double reel assembly, and

Figure 3 is a detail of Figure 1.

There are various possible arrangements of rigid reels and flexible bands, as illustrated diagrammatically in Figure 1.

In Figure 1(a) there are two rigid reels 1 and 2, the diameter of the smaller reel 1 being less than the radius of the larger reel 2. Thus the drive shaft 3 of the larger reel can be clear of the smaller one and the stepper motors (not shown), which are the usual drive motors, can both be on the same side of the reels.

In Figures 1(b) and 1(c) there are two co-axial reels, the inner reel 4 being only slightly smaller than the outer reel 5. There could be co-axial drive shafts, one being hollow, so that both reels could be driven from the same side. But that would mean a toothed belt transmission or gearing on to the outer shaft from a non co-axial motor, and

that is an undesirable complication. Alternatively, the stepper motors could be on opposite sides of the reel, but that would require extra width and the windows in which parts of the reel peripheries show would have to be spaced  
5 further apart than normal. The preferred solution is to have one reel conventionally driven and the other to be carried by rollers spaced around the circumference, one of them being a drive roller.

In Figure 1(b) the inner reel 4 is so carried and  
10 driven, there being two idler rollers 6 and a drive roller 7, evenly spaced around the axis. The drive roller 7 can be on the output shaft of a co-axial stepper motor, and it will have sprocket teeth to engage positively with apertures or teeth around the inside of the reel 4.

15 In figure 1(c) the arrangement is reversed, with the inner reel 4 driven conventionally and the outer reel 5 supported by external idler rollers 8 and an external drive roller 9.

In Figure 1(d) there is an inner reel 10, conventional-  
20 ly driven. Outside this there is a flexible endless band 11 guided in an elongate loop (trapezoidal here but many other configurations are possible), approaching the inner reel 10 over the short portion of the latter's periphery that registers with a window 12 in a display screen 13. This band is  
25 supported and guided by a plurality of idler rollers 14 and a sprocket roller 15, which also drives it.

In Figure 1(e), there are two looped bands 16 and 17 one inside the other, supported, guided and driven in a



similar manner to the band 11 of Figure 1(d). Where they come into registry with the screen window 12 their side edges may encounter guides 18 which shape them locally into a curve convex towards the window, simulating the appearance of rigid reels. A similar guide may be provided for the band 11 of Figure 1(d).

In Figures 1(f) there is a rigid outer reel 19 and an inner endless band 20. This loops in and out around the axis of the reel 19, supported, guided and driven in a similar manner to the band 11 of Figure 1(d) except that some of the rollers are external. The band 20 can thus be considerably longer than the circumference of the reel 19 and carry more symbols.

It will be understood that back lighting will be provided within the innermost reel or band and opposite the associated window 12 so that, on selected occasions, two symbols in registry, one on the transparent outer reel or band and the other on the opaque but translucent inner reel or band, will be back lit and appear superimposed to the player.

Figures 2 and 3 show in slightly more detail how the arrangement of Figure 1(b) might be configured in practice.

An inner reel 21 is co-axially carried within an outer reel 22 by three wheels 23, 24 and 25 engaging the reel internally at 120° intervals. The wheel 23 is driven by a co-axial motor 26 at the top of a frame 27 while the wheels 24 and 25 are idlers but with limited freedom of movement radial of the main axis A. Springs (not shown) urge them

against the inside of the reel 21, and they serve as tensioning wheels to keep the reel 21 firmly in engagement with the drive wheel 23. The wheels 24 and 25 are rubber coated, while the drive wheel 23 has a toothed rubber belt  
5 28 around its periphery to engage projections 29 on the inner reel, and thus transmit positive non-slip drive.

The outer reel 22 is carried and driven in the conventional manner by a co-axial stepper motor (not shown) carried by the frame 27.

10 In the embodiments described, each reel or band is driven independently of the other. However, it would be possible to have a common drive with a transmission and game software that, while the reels or bands do not move in unison together, ensures that symbols on the inner and outer  
15 bands register on the win line when the reels stop. Also, rather than a continuous drive to both reels or bands, one could be driven continuously while the other might be indexed round, for example one symbol position at a time, by a lost motion connection from the drive to said one reel or  
20 band.

It will be understood that not every symbol position on each band is necessarily occupied by a symbol. One or more of such positions may be left blank so that on some occasions there may be no superimposition of symbols on the win  
25 line. However, in the following claims 'symbol' is to be interpreted as meaning both a visible symbol and an invisible or blank symbol.

CLAIMS

1. A reel assembly for gaming or amusement-with-prizes machines, the assembly having two symbol-bearing endless bands one within the other and movable around their own loops, the outer one having a transparency that makes the portion presented to the player, when movement ceases, display an overlay of one symbol over another.
2. A reel assembly as claimed in Claim 1, wherein the bands are on rigid reels.
3. A reel assembly as claimed in any Claim 2, wherein the inner reel has a diameter less than the radius of the larger reel, the reels being virtually tangential at the win line position.
4. A reel assembly as claimed in Claim 2, wherein the reels are co-axial, the inner one being marginally smaller than the outer one.
5. A reel assembly as claimed in Claim 4, wherein one reel is supported and guided by at least three rollers distributed around its periphery, at least one roller having a driving engagement with said one reel.
6. A reel assembly as claimed in Claim 5, wherein said one reel is the outer reel and the rollers are external.
7. A reel assembly as claimed in Claim 5, wherein said one reel is the inner reel, and the rollers are internal.
8. A reel assembly as claimed in Claim 1, wherein at least one band is flexible, entrained round rollers,

provided with sprocket holes, and driven by a sprocket wheel.

9. A reel assembly as claimed in Claim 8, wherein the outer band is flexible and the inner band is on a rigid  
5 reel.

10. A reel assembly as claimed in Claim 8, wherein both bands are flexible.

11. A reel assembly as claimed in Claim 9 or 10, wherein said portion of the outer band presented to the  
10 player is guided to simulate the periphery of a large radius reel.

12. A reel assembly as claimed in Claim 8, wherein the inner band is flexible and the outer band is on a rigid reel.

15 13. A reel assembly as claimed in any preceding Claim, wherein the inner band has symbols on a translucent background which enables the overlaid symbols on the win line, at least, to be backlit.

14. A reel assembly as claimed in any preceding claim,  
20 wherein the bands are independently driven.

15. A reel assembly as claimed in any one of Claims 1 to 13, wherein the bands have a common drive but do not move in unison.

16. A reel assembly as claimed in Claim 18, wherein  
25 one band is indexed by a lost motion connection from the continuous drive to the other band.

17. A reel assembly for gaming or amusement-with-prizes machines substantially as hereinbefore described with

reference to the accompany drawings.



Application No: GB 9823899.1  
Claims searched: All

Examiner: Geoff Nicholls  
Date of search: 26 January 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): G4V (VAA)

Int Cl (Ed.6): G07F 17/32 17/34

Other: ONLINE:WPI, EDOC

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2251113 A (BELL-FRUIT)	
X	GB 2165074 A (JPM) Whole document relevant	1, 2, 4, 13, 14
X, P	US 5752881 (INOUE) Whole document relevant	1, 2, 4, 8, 10, 14
X	US 5395111 (INOUE) Whole document relevant	1, 2, 4, 13, 14

X Document indicating lack of novelty or inventive step  
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P Document published on or after the declared priority date but before the filing date of this invention.  
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